

REMARKS

Claims 11-27 are now pending, with Claim 11 being the sole independent claim. Former claims 25, 27 and 30 have been cancelled without prejudice to or disclaimer of the subject matter recited therein.

Claim 11 has been amended to recite "capable of producing delta¹²-epoxygenated fatty acids". Support for this can be found in the specification on page 5 at lines 31-35. Thus, no new matter has been added.

Claims 23 and 24 have been amended to recite a host cell. Support for this can be in the specification on page 8 at lines 16-24, page 17 at lines 26-27, page 19 at lines 25-37 and in Examples 4, 5 and 6. Thus, no new matter has been added.

Submitted herewith is a copy of the IDS submitted in connection with the parent application having Application Number 09/909,566 filed July 20, 2001 that was initialed by Examiner Kerr as indicating consideration of these reference. Copies of the references listed at pages 5-10 of the IDS filed June 1, 2004, are re-submitted herewith since they appear to missing from the file of the parent application, 09/909,566.

It was noted on page 2 of the Office Action that the title of the ADS and Oath are different from the title recited on page 1 of the instant specification and on the abstract. Clarification was requested. The correct title is the following: "A CYTOCHROME P450 ENZYME ASSOCIATED WITH THE SYNTHESIS OF Δ^{12} -EPOXY GROUPS IN FATTY ACIDS OF PLANTS".

The specification has been amended to recite the continuation data in the first paragraph of page 1.

The specification also has been amended to show the SEQ ID NO: of the second amino acid sequence recited in the description of Fig.1 on page 2 of the instant specification. This sequence appears in the sequence listing as originally submitted. Thus, no new matter has been added.

Claims 23 and 24 were rejected under 35 U.S.C. §101 on the ground that the claimed invention is directed to non-statutory subject matter. It was stated on page 3 of the Office Action that the claims are drawn to a cell without recitation of "isolated" and that therefore the claims do not explicitly indicate the hand of man.

It is respectfully submitted that the claims to indeed indicate the "hand of man." Claim 23 depends from claim 11 and, thus, claim 23 encompasses all of the limitations of claim 11. Since claim 11 recites an "isolated polynucleotide", then this limitation is also part of claim 23. Therefore, "the cell" as recited in claim 23 comprises an "isolated polynucleotide" and, thus, the hand of man is indicated in claims 23.

The foregoing discussion is equally apposite with respect to claim 24 since claim 24 depends from claim 23.

Furthermore, claims 23 and 24 have been amended to recite a "host" cell. Examiner's attention is kindly invited to the specification page 8 at lines 16-24, page 17 at lines 26-27, page 19 at lines 25-37 and Examples 4, 5 and 6. These sections refer to or discussion expression in host cells.

Withdrawal of the rejection of claims 23 and 24 under 35 USC §101 is respectfully requested in view of the above discussion and claim amendments.

Claims 11-20, 23, 24, 26, 28 and 29 were rejected under 35 USC §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It is respectfully submitted that the specification discloses, to one of ordinary skill in the art, a representative number of cytochrome P450 enzymes capable of producing epoxygenated delta-12 fatty acids wherein said polypeptide has at least 50% sequence identity based on the Clustal method of alignment when compared to a polypeptide of SEQ ID NO:2. Accordingly, the specification does not disclose just a single polynucleotide encoding SEQ ID NO:2.

The specification at page 7, line 4 through page 8 line 11, discloses alterations in nucleotide sequence that are not expected to alter functionality, such as alterations that produce a chemically equivalent amino acid at a given site or alterations in the N- or C-terminal portions. Thus, from the foregoing, the skilled artisan would immediately understand the specification to disclose a representative number of polynucleotide sequences, having different nucleotide substitutions, that encode

cytochrome P450 enzymes capable of producing epoxygenated delta-12 fatty acids but that vary (having at least 50% sequence identity) of SEQ ID NO:2.

Furthermore, there is a correlation of structure and function with respect to the peptide variants encoded by the polynucleotides.

Submitted herewith is a copy of Choe et al. The Plant Cell (1998) 10: 231-243 which discloses distinctive features in the polypeptide sequence of cytochrome P450 enzymes:

- 1) an I helix with the consensus sequence (A/G)GX(D/E)T(T/S), typical for group A cytochromes P450; and
- 2) a heme-binding domain with the consensus sequence PFG(A/S/V)GRRXC(P/A/V)G.

These same features can be found in the sequences of the instant invention. Attached hereto as Appendix A is a comparison of SEQ ID NO:2 of the instant invention with the pepper cytochrome P450 polypeptide sequence (Table 3 & 4 of instant application; NCBI GI No. 6739506). The two motifs of Choe et al. are shown underlined on Appendix A. The *Euphorbia lagascae* P450 enzyme possesses both of the sequence motifs. The amino acids conserved among all sequences are indicated with an asterisk (*) on the top row; dashes are used by the program to maximize alignment of the sequences.

Furthermore, Examples 7, 8 and 9 disclose methods with respect to assessing the function of a P450 enzyme as an epoxy-group synthesizing enzyme.

In view of the foregoing, withdrawal of the claims under 35 USC 35 USC §112, first paragraph, is respectfully requested.

Claims 11-24, 26, 28 and 29 were rejected for being indefinite because of the use of the term "a cytochrome P450 enzyme associated with the synthesis of delta12-epoxy fatty acids."

Claim 11 has been amended, as discussed above, to recite an enzyme capable of producing delta12- epoxygenated fatty acids. The term "epoxygenated" is defined in the specification on page 5 at lines 31-35:

The terms "epoxy group", "epoxygenated fatty acids", or "the product of an epoxygenase" all refer to the introduction of an epoxide bridge (an oxygen atom covalently bonded to carbon atoms that are in turn covalently bonded to each other, to form a three member ring that is part of a larger molecular structure) at the site of a double bond in the acyl chain of a fatty acid.

One skilled in the art would have no difficulty understand the term "epoxygenated."

Accordingly, Applicants respectfully request withdrawal of rejection of the claims under 35 USC Section 112, 2nd paragraph, in view of the above discussion and amendment.

It is believed that the claims are now in form for allowance which allowance is respectfully solicited.

A petition for a three (3) month extension of time and a copies of the references missing from the parent file accompany this response.

Please charge any fees or credit any overpayment of fees, which are required in connection herewith to Deposit Account No. 04-1928 (E.I. duPont de Nemours and Company).

Respectfully submitted,



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